MISSION ARCHITECTURE STUDIES

Facility Science Team Overview

Paul Caruso

Mission Architecture Studies
Cooperative Agreement Notice

Paul Caruso
FST Meeting
September 24, 1998

A **Cooperative Agreement Notice (CAN)** was issued on March 16, 1998 to encourage the involvement and collaboration of knowledgeable aerospace industry partners in the early stages of requirements planning and mission architecture development.

The **primary objectives** of the study were to:

- develop innovative mission concepts that meet science objectives
- assess feasibility of cost target
- provide strategies to minimize life cycle costs
- identify key technologies that enable or enhance the mission
- narrow the initial trade space

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Terms And Deliverables

- 150 Day Period Of Performance
- $110,000 NASA Funding For Each Study
- Matching Industry Contribution
- Bi-Weekly Videoconferences/Teleconferences
- Mid-Term And Final Reports

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Assumptions

- The Mission Implementation Phase for Constellation-X begins in early FY2004.
- The full constellation is in orbit by the end of FY2008.
- The overall mission cost should be on the order of $300M from formulation through operations exclusive of technology development and flight production for the SXT optic subassemblies, microcalorimeter, grating/CCD, HXT optics and detectors, and science operations.

Mission Requirements

- Mission Life ----------3 Years For Full Constellation
- Reliability ----------No Single Failure That Results In Loss Of More Than 33% Of Mission Science
- Effective Area ----------15,000 square cm @ 1 keV (SXT)
  6,000 square cm @ 6.4 keV (SXT)
  1,500 square cm @ 40 keV (HXT)
- Band Pass ---------- 0.25 to 10 keV (SXT)
  6 to 40 keV (HXT)
- Minimum Field Of View ---------- 2.5 arcmin (SXT)
  8 arcmin (HXT)
- Telescope Angular Resolution ----------15 arcsec HPD (SXT)
  1 arcmin HPD (HXT)
- Minimum Spectral Resolving Power ---------- 300 from 0.25 to 10 keV (SXT)
  3000 at 6 keV (SXT)
  10 at 40 keV (HXT)

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Team Leaders

- Paul Caruso/GSFC+SAO
- Dr. Charles Lillie/TRW
- Dr. Mark Skinner/BATC

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GSFC/SAO Team Activities

- HTXS Study Team Report/August 1997
- Integrated Mission Design Center Study Report/April 1998
- Requirements Definition
- Instrument Accommodation Studies
- Configuration Studies
- Extendible Optical Bench Studies
- Orbit Trade Summary
- Detailed Mass And Power Estimates For Point Of Reference
- Subsystem Concepts And Block Diagrams